

AMENDMENTS TO THE CLAIMS

1.(currently amended): A network system [[,]] comprising a high-order node network performing label switching, which includes including a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, in which data transferred from each of the low-order nodes is transferred and transfers data to another low-order node through the high-order node network, wherein the network system comprising:

~~the high order node network comprises a first and second high-order node nodes, each of which is provided on the high-order network as one of the plurality of high-order nodes; and a second high order node;~~

a first low-order node is provided on the high-order network as one of the plurality of low-order nodes, wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line comprise a first low-order node as a low order node of the first high order node,

wherein the first low-order node comprises comprising:
a first output port to transmit data to the first high-order node via said at least one physical line;

a second output port to transmit data to the second high-order node via said at least one physical line;

a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes;

a detection section detecting, in the case of the first output port is selected by the selecting section, a communication failure between the first low-order node and the first high-order node;

a host change request section making a request to requesting the second

high-order node that the second high-order node serves as a high-order node [[of]] for the first low-order node in place of the first high-order node when the detection section detects the communication failure; and

a low-order node setting section performing ~~at least one of process processes~~ for causing the first low-order node to transmit data to the second high-order node in place of the first high-order node on the basis of [[the]] process information transmitted from the second high-order node, wherein the selecting section selects the second output port as one of the processes, and

wherein the second high-order node ~~comprises~~ comprising:

a high-order node setting section performing at least one of process for causing the second high-order node to transmit data received from the first low-order node to another low-order node corresponding to a destination of the data according to the request of the host change request section; and

a process information transmission section transmitting the process information corresponding to the process performed by the high-order node setting section to the first low-order node.

2.(currently amended): A network system [[,]] comprising a high-order node network performing label switching, which includes including a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, in which data transferred from each of the low-order nodes is transmitted and transfers data to another low-order node through the high-order node network, wherein the network system comprising:

~~the high-order node network comprises a first and second high-order node nodes, each of which is provided on the high-order network as one of the plurality of high-order nodes; and a second high-order node,~~

a first low-order node is provided on the high-order network as one of the plurality of low-order nodes, comprises a first low-order node serving as a low-order node of the first high-order node wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes,

wherein the first high-order node comprises comprising:

a detection section detecting, in the case of when the first output port is selected by the selecting section, a communication failure between the first high-order node and the first low-order node; and

a host change request section making a request to requesting the second high-order node that the second high-order node serves as a high-order node [[of]] for the first low-order node in place of the first high-order node when the detection section detects the communication failure,

wherein the second high-order node comprises comprising:

a high-order node setting section performing at least one of process for causing the second high-order node to transmit data received from the first low-order node to another low-order node corresponding to a destination of the data according to the request of the host change request section; and

a process information transmission section transmitting process information corresponding to the process performed by the high-order node setting section to the first low-order node, and

wherein the first low-order node comprises comprising:

a low-order node setting section performing at least one of process for causing the

first low-order node to transmit data to the second high-order node in place of the first high-order node on the basis of the process information transmitted from the process information transmission section, wherein the selecting section selects the second output port based on the process information.

3.(currently amended): A network system [[,]]comprising a high-order node network performing label switching, which includes including a plurality of high-order nodes[[,]] and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes[[,]] and a high order computer for monitoring at least one of the plurality of high order nodes in which each of the low order nodes transfers data to another low-order node through the high-order node network, wherein the network system comprising:

the high order node network comprises a first and second high-order node nodes, and a second high order node each of which is provided on the high-order network as one of the plurality of high-order nodes;

the plurality of a first low-order node nodes is provided on the high-order network as one of the plurality of comprises a first low-order node nodes, serving as a low order node of the first high order node wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line, and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes; and

a high-order computer for monitoring at least the first high-order node, wherein the high-order computer comprises comprising:

a detection section detecting, in the case of when the first output port is selected by the selecting section, a failure of the first high-order node; and

a host change request section making a request to requesting the second high-order node that the second high-order node serves as a high-order node [[of]] for the first low-order node in place of the first high-order node when the detection section detects the failure of the first high-order node,

wherein the second high-order node comprises comprising:

a high-order node setting section performing a process of causing the second high-order node to transmit data received from the first low-order node to another low-order node corresponding to a destination of the data according to the request of the host change request section; and

a process information transmission section transmitting process information corresponding to the process performed by the high-order node setting section to the first low-order node, and

wherein the first low-order node comprises comprising:

a low-order node setting section for performing at least one of process for causing the first low-order node to transmit data to the second high-order node in place of the first high-order node on the basis of the process information transmitted by the process information transmission section, wherein the selecting section selects the second output port based on the process information.

4.(original): A network system according to the claim 1, wherein

each of the high-order nodes holds path information corresponding to a transmission route of data in the high-order node network,

each of the low-order nodes receives the path information from a high-order node corresponding to the low-order node itself and, when data is transferred to the high-order node, adds path information corresponding to a destination of the data to the data,

each of the high-order nodes transmits the data transferred from a low-order

node to another low-order node according to the path information added to the data, the first low-order node further comprises:

a memory section storing path information added to data when the data is transmitted to the high-order nodes; and

an updating section for receiving updated path information transmitted from the second high-order node to update the memory section on the basis of the updated path information,

the high-order node setting section of the second high-order node generates updated path information as new path information corresponding to a transfer route using the second high-order node as a source node in the high-order node network according to a request of the host change request section, and

the process information transfer section of the second high-order node transmits the updated path information formed by the high-order node setting section to the first low-order node.

5.(original): A network system according to the claim 2, wherein

each of the high-order nodes holds path information corresponding to a transfer route of data in the high-order node network,

each of the low-order nodes receives the path information from a high-order node corresponding to the low-order node itself and, when data is transmitted to the high-order node, adds path information corresponding to a destination of the data to the data,

each of the high-order nodes transmits the data transmitted from a low-order node to another low-order node according to the path information added to the data,

the high-order node setting section of the second high-order node generates updated path information as new path information corresponding to a transfer route using the second high-order node as a source node in the high-order node network according to a request

of the host change request section,

the process information transmission section of the second high-order node transmits the updated path information generated by the high-order node setting section to the first low-order node,

the first low-order node further comprises a memory section storing path information added to data when the data is transmitted to the high-order nodes, and

the low-order node setting section of the first low-order node receives the updated path information transmitted from the second high-order node to update the storage section on the basis of the updated path information.

6.(original): A network system according to the claim 2, wherein

each of the high-order nodes holds path information corresponding to a transfer route of data in the high-order node network,

each of the low-order nodes receives the path information from a high-order node corresponding to the low-order node itself and, when data is transmitted to the high-order node, adds path information corresponding to a destination of the data to the data,

each of the high-order nodes transmits the data transmitted from a low-order node to another low-order node according to the path information added to the data,

the detection section of the first high-order node detects a failure of the first high-order node itself,

the host change request section of the first high-order node requests the second high-order node that the second high-order node serves as the high-order node of the first low-order node in place of the first high-order node when the failure of the first high-order node itself is detected by the detection section,

the high-order node setting section of the second high-order node generates updated path information serving as new path information corresponding to a transfer route

which uses the second high-order node as a source node in the high-order node network and does not comprise the first high-order node according to a request of the host change request section,

the process information transmission section of the second high-order node transmits the updated path information generated by the high-order node setting section to the first low-order node,

the first low-order node further comprises a memory section for storing path information added to data when the data is transmitted to the high-order nodes, and

the low-order node setting section of the first low-order node receives the updated path information transmitted from the second high-order node to update the storage section on the basis of the updated path information.

7.(original): A network system according to the claim 3, wherein

each of the high-order nodes generates path information corresponding to a transfer route of data in the high-order node network,

each of the low-order nodes receives the path information from a high-order node corresponding to the low-order node itself and, when data is transmitted to the high-order node, adds path information corresponding to a destination of the data to the data,

each of the high-order nodes transmits data transmitted from a low-order node to another low-order node according to the path information added to the data,

the high-order node setting section of the second high-order node generates updated path information serving as new path information corresponding to a transfer route which uses the second high-order node as a source node in the high-order node network and does not comprise the first high-order node according to a request of the host change request section,

the process information transmission section of the second high-order node transmits the updated path information generated by the high-order node setting section to the first low-order node,

the first low-order node further comprises a memory section for storing path information added to data when the data is transmitted to the high-order nodes, and

the low-order node setting section of the first low-order node receives the updated path information transmitted from the second high-order node to update the storage section on the basis of the updated path information.

8.(currently amended): A service recovering method in a network system[[],] comprising a high-order node network constituted by a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, ~~in which each of the high-order nodes holds having~~ path information corresponding to [[a]] transfer route routes of data in the high-order node network, each of the low-order nodes ~~receives receiving~~ the path information from a high-order node corresponding to the low-order node itself and, when ~~data is transmitted transmitting data~~ to the high-order node, ~~adds adding~~ the path information corresponding to a destination of the data to the data, each of the high-order nodes ~~transmits transmitting the data transmitted received~~ from a low-order node ~~toward~~ another low-order node according to path information added to the data, the plurality of high-order node nodes ~~network comprises including a first and second high-order node nodes, and a second high order node~~, and the plurality of low-order nodes ~~comprise including~~ a first low-order node, serving as a ~~low order node of the first high order node, wherein the method comprising:~~

the first low-order node detecting a communication failure between the first high-order node and the first low-order node, wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line, and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes, and the first low-order node

detects the communication failure when the first output port is selected by the selecting section;
the first low-order node requests requesting to the second high-order node that the second high-order node serves as the a high-order node [[of]] for the first low-order node in place of the first high-order node when a the communication failure between the first low-order node and the first high-order node is detected[[,]] :

the second high-order node recognizes recognizing the first low-order node as the low-order node of the second high-order node itself according to the request of from the first low-order node and transmits transmitting to the first low-order node, process information including updated path information serving as new path information corresponding to a transfer route using passing through the second high-order node as a source node in the high order node network to the first low order node, ; and

the first low-order node receives receiving the process information with updated path information transmitted from the second high-order node and updates updating the contents of a memory section, for which has stored path information to be added to data when the data is transmitted to the second high-order node, on the basis of the updated path information, wherein the selecting section selects the second output port based on the process information.

9.(currently amended): A service recovering method in a network system [[,]] comprising a high-order node network constituted by a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, in which each of the high-order nodes holds having path information corresponding to transfer route routes of data in the high-order node network, each of the low-order nodes receives receiving the path information from a high-order node corresponding to the low-order node itself and, when data is transmitted transmitting data to the high-order node, adds adding path information corresponding to a destination of the data to the data, each of the high-order nodes transmits transmitting the data transmitted received from a low-order node to

another low-order node according to the path information added to the data, the plurality of high-order node nodes network comprises including a first and second high-order node nodes, and a second high-order node, and the plurality of low-order nodes comprise including a first low-order node, serving as a low order node of the first high order node wherein the method comprising:

the first high-order node detecting a communication failure between the first low-order node and the first high-order node, wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line, and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes, and the first high-order node detects the communication failure when the first output port is selected by the selecting section;

the first high-order node requests requesting to the second high-order node that the second high-order node serves as the a high-order node [[of]] for the first low-order node in place of the first high-order node when [[a]] the communication failure between the first low-order node and the first high-order node is detected[[,]] ;

the second high-order node recognizes recognizing the first low-order node as the low-order node of the second high-order node itself according to the request of from the first high-order node, and transmits transmitting to the first low-order node, process information including updated path information serving as new path information corresponding to a transfer route using passing through the second high-order node as a source in the high order node network to the first low order node, ; and

the first low-order node receives receiving the process information with the updated path information transmitted from the second high-order node and updates updating the contents of a memory section, for which has storing stored path information to be added to data

when the data is transmitted to the second high-order node, on the basis of the updated path information, wherein the selecting section selects the second output port based on the process information.

10.(currently amended): A service recovering method in a network system[[],]
comprising a high-order node network constituted by a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, in which each of the high-order nodes holds having path information corresponding to transfer route routes of data in the high-order node network, each of the low-order nodes receives receiving the path information from a high-order node corresponding to the low-order node itself and, when data is transmitted transmitting data to the high-order node, adds adding path information corresponding to a destination of the data to the data, each of the high-order nodes transmits transmitting the data transmitted received from a low-order node to another low-order node according to the path information added to the data, the plurality of high-order node nodes network comprises including a first and second high-order node nodes, and a second high order node, and the plurality of low-order nodes comprise including a first low-order node, serving as a low order node of the first high order node wherein the method comprising:

the first high-order node detecting a failure of the first high-order node itself, wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line, and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes, and the first high-order node detects the failure of the first high-order node itself when the first output port is selected by the selecting section;

the first high-order node requests requesting to the second high-order node that the second high-order node serves as the high-order node [[of]] for the first low-order node in place of the first high-order node when a failure of the first high-order node itself is detected[[,]]; ;

the second high-order node recognizes recognizing the first low-order node as the low-order node of the second high-order node according to the request of the first high-order node, and transmits transmitting to the first low-order node, process information including updated path information serving as new path information corresponding to a transfer route using passing through the second high-order node as a source node in the high order node network and does not comprise the first high order node to the first low order node, ; and

the first low-order node receives receiving the process information with the updated path information transmitted from the second high-order node and updates updating the contents of a memory section, for which has storing stored path information to be added to data when the data is transmitted to the second high-order nodes node, on the basis of the updated path information, wherein the selecting section selects the second output port based on the process information.

11.(currently amended): A service recovering method in a network system[[,]] comprising a high-order node network constituted by a plurality of high-order nodes and a plurality of low-order nodes, each of the low-order nodes is connected to one of the plurality of high-order nodes, and a high-order computer for managing the high-order node network, in which each of the high-order nodes generates generating path information corresponding to a transfer route routes of data in the high-order node network, each of the low-order nodes receives receiving the path information from a high-order node corresponding to the low-order node itself and, when transmitting data is transmitted to the high-order node, adds adding path information corresponding to a destination of the data to the data, each of the high-order nodes transmits transmitting data transmitted received from a low-order node to another low-order node

according to the path information added to the data, the plurality of high-order node nodes network comprises including the first and second high-order node nodes, and the second high order node, and the plurality of low-order nodes comprise including a first low-order node, serving as a low order node of the first high order node, wherein the method comprising:

the high-order computer detecting a failure of the first high-order node, wherein the first low-order node is connected to the first and second high-order nodes via at least one physical line, and includes a first output port to transmit data to the first high-order node via said at least one physical line, a second output port to transmit data to the second high-order node via said at least one physical line, and a selecting section to select one of the first and second output ports in order that the first low-order node transmits data to one of the first and second high-order nodes, and the high-order computer detects the failure of the first high-order node when the first output port is selected by the selecting section;

the high-order computer requests requesting to the second high-order node that the second high-order node serves as the a high-order node [[of]] for the first low-order node in place of the first high-order node when the failure of the first high-order node itself is detected[[,]] :

the second high-order node recognizes recognizing the first low-order node as the a low-order node of the second high-order node itself according to the request of the high-order computer, and transmits transmitting to the first low-order node, process information including updated path information serving as new path information corresponding to a transfer route using passing through the second high-order node as a source node in the high order node network and does not comprise the first high order node to the first low order node, ; and

the first low-order node receives receiving the process information with the updated path information transmitted from the second high-order node and updates updating the contents of a memory section, for which has stored stored path information to be added to data when the data is transmitted to the second high-order nodes node, on the basis of the updated

path information, wherein the selecting section selects the second output port based on the process information.